which is characteristic of the white stars, bright, with dark absorption lines on the blue side.

Besides the hydrogen series there appear to be other lines doubled in a similar manner, including the sodium lines at D. The line K, which is at least as strongly impressed upon the plate as H, is not followed by so strong an absorption.

In the green part of the spectrum three very brilliant lines are seen on the red side of F. One of these falls not far from the position of the chief nebular line; but even when the shift of the spectrum is taken into account, we can scarcely regard this line as the true nebular line. In this connexion it was a point of some importance to find that the strong and very characteristic line of the Orion nebula, which falls about λ 3725, is absent in our photograph of the Nova, also the strong line between α and β at about λ 3868.

[The third line from F is rather broad and resolvable into lines. It falls partly upon the more refrangible pair of the magnesium triplet at *b*, but its character and position do not permit us to ascribe it either to magnesium or carbon.—Feb. 25.]

We wish to mention an early photograph of this star taken on the 3rd instant by Father Sidgreaves, at Stonyhurst, which we had the privilege of examining. This successful photograph extends from about *h* to near D, and shows the remarkable doubling of many of the bright lines by dark ones, a feature which was at once noticed by Father Sidgreaves and ourselves.

In our photograph the spectrum of the star, which extends on the plate as far into the ultra-violet as our photographs of Sirius, is crowded throughout its entire length with dark and bright lines. In the visible region the number of bright lines and groups, including the double line of sodium, a fine line about the position of D_3, and lines on both sides of C, is also very great.

We prefer in this preliminary note not to enter into any more detailed discussion of the star's spectrum, nor to refer to the probable phenomena which may now be in progress in this celestial body. We reserve these considerations for the present.

II. "Note on the New Star in Auriga." By J. Norman Lockyer, F.R.S. Received February 25, 1892.

Since my note of February 11, observations of the new star have only been possible at Kensington on seven evenings, namely, February 11, 12, 13, 16, 22, 23, and 24. The 13th and 22nd were the only two very fine nights.

The star now appears to be fading. In the photograph of the region taken on February 3 the Nova appeared to be brighter than

χ Aurigæ (mag. 5·0), but in that taken on February 23 it is not brighter than the companion to this star, which is fainter than 6th magnitude. No marked diminution in brightness was noticed before February 22.

The colour has not appreciably changed since the star was first observed.

Photographs of the spectrum were attempted on all the dates named. Those of February 11, 12, 16, and 23, however, were insufficiently exposed, but they show that the dark lines were still more refrangible than the accompanying bright ones, and that the same lines were present as in the previous photographs. A plate was exposed for 2 hours 35 minutes on February 24, but no impression was obtained. The photograph taken on February 13 is identical with those referred to in the notes which I have already communicated to the Society. In the three photographs of February 22 there appears to be a slight diminution in the intensity of the H and K lines, but otherwise there is no decided change.

There is no evidence of revolution during the twenty days of observation. In all the photographs the dark lines are more refrangible than the bright ones, and the relative velocity deduced from those of February 3, 7, 13, and 22 appears to be about 600 miles per second. As this only represents the velocity in the line of sight, we are still ignorant of the real velocities of the two bodies. The constant relative velocity indicated by the displacement of the bright and dark lines may be regarded as confirming the supposition that two meteor-swarms or comets have collided, the velocities being so great, and the masses so small, that neither was captured by the other.

The relative velocity of 600 miles per second seems at first sight to be abnormally great, but, if we regard each of the component swarms as moving at the rate of 300 miles per second, the velocities are quite comparable with those of other bodies in space. The star 1830, Groombridge, for example, moves at the rate of 200 miles per second across the line of sight, and its real velocity may be much greater.

Eye observations have been made on every possible occasion. The chief variations from those previously reported are the general fading of the continuous spectrum and the consequent unmasking of the lines between *b* and D. Micrometric measures of four new lines in this region were made by Mr. Fowler on February 23 and 24. These, with the other lines observed at Kensington in the region F to C, are shown in the table which follows. The corresponding lines observed in the spectra of new stars which have previously appeared, and those in the spectra of some of the bright line stars, are added for comparison.

Nova Aurigæ.		Nova Cygni.			Nova Andromedæ.	Nova Coronæ.	γ Argus.	Arg. Oeltz. 17681.	Lalande, 13412.	Cygnus.			γ Cassiopeiæ (Sherman).	Suggested origins.
Feb. 23.	Feb. 24.	Cornu.	Vogel.	Copeland.						1st.	2nd.	3rd.		
656 (C)	656	661	656	656	—	656	—	—	—	—	—	—	—	H (656·2).
635	630	635	630	630	—	—	—	—	—	—	636	636	635	
589 (D)	—	588	589	589	—	—	590	—	—	—	—	—	—	Na (589·1)
579	579	—	580	577·5	—	—	580·9	581	581	583	581	581	—	Fe (579·0)
—	570	—	—	—	—	—	—	—	—	571	570	569	—	
566	—	563	564	—	—	—	566	—	—	—	—	564	—	C (563·5)
558	558·3	—	—	—	558	—	—	—	—	558	—	558	556	Mn (557·6)
531	531·5	531	531	—	—	—	—	—	—	—	—	—	531	
518	517·7	518	—	—	517	—	—	—	—	—	—	517	517	C (516·5) or Mg (517·5)
500·6	500·6	500	499	502	—	501	—	—	—	—	—	—	499	Mg (500·6)
490	490·3	—	490	—	—	—	—	—	—	—	—	—	—	
486 (F)	486·2	483	486	486	486	486	—	—	—	—	—	—	486	H (486·2)

It will be seen that all the lines of Nova Aurigæ have previously been recorded in other Novæ, or in the bright-line stars.

The complete spectrum, including the photographic region, was shown in the diagram exhibited on the screen. This, and the light curve of the spectrum from F to C, was drawn by Mr. Fowler and Mr. W. J. Lockyer, on February 22, and confirmed by Mr. Fowler on February 23. The 3-foot reflector and McClean spectroscope were employed in each case.

The changes which are taking place in the Nova are exactly what would be expected according to my hypothesis, that new stars are produced by the collision of meteor-swarms. The rapid fading of the star demonstrates that small masses and not large ones are engaged, and this is further confirmed by the observed diminution in the brightness of the continuous spectrum relatively to the bright lines. If two condensed bodies were in collision, it is evident that the lines would fade first.

III. "On the Organisation of the Fossil Plants of the Coal-Measures. Part XIX." By W. C. WILLIAMSON, LL.D., F.R.S., Professor of Botany in the Owens College, Manchester. Received January 18, 1892.

(Abstract.)

The author recalls attention to the discovery by the late Rev. W. Vernon Harcourt of a fragment of a Lepidodendroid branch, in which the internal structures were well preserved. The specimen was described and figured, first by Witham, who gave to it the well-known name of *Lepidodendron Harcourtii*. It was next described by Lindley and Hutton, in their 'Fossil Flora,' and still later, and more scientifically, by Brongniart, in his 'Végétaux Fossiles.' In its interior Brongniart found a single vascular cylinder encasing a medulla. At a later period he obtained fragments of two other plants, in each of which he found the above cylinder, but invested by a second one which was obviously an exogenous product of a cambium zone. From these three specimens he unfortunately concluded that the first belonged to a Cryptogamic Lycopod, whilst the second and third were Gymnospermous Phanerogams. These latter examples he further identified with his genus *Sigillaria*.

This classification was universally accepted by the palæobotanical world until 1871, when, in his Memoir, Part II, the author announced his conviction that Lepidodendra and Sigillariæ were alike Cryptogams, and that the exogenous zone supposed to be characteristic of the Phanerogams was not confined, in ancient times, to that great division of the vegetable kingdom.